

PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2012 Fisheries Management Survey Report

**Pat Mayse Reservoir**

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July 31, 2013

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Pat Mayse Reservoir were surveyed in 2012 using electrofishing and in 2013 using gill netting. Historical data are presented with the 2012-2013 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Pat Mayse Reservoir is a 5,940-acre impoundment located in Lamar County, Texas, on Sanders Creek, a tributary of the Red River. It was constructed by the U.S. Army Corps of Engineers in 1967 for flood control, and as a municipal and industrial water supply. The major habitat components observed were native submerged, floating, and emergent aquatic vegetation, and standing timber. Total vegetation coverage was 4% of reservoir surface area. Hydrilla has been reported in the reservoir since 2000, although coverage has remained below 1% of reservoir area. Hydrilla was not observed in the summer 2012 vegetation survey.
- **Management History:** Largemouth bass, White Bass, and Channel Catfish provide important sport fisheries. Palmetto Bass stockings were discontinued in 2000. The fisheries management plan from the 2008 survey report recommended monitoring the Largemouth Bass population every other year through fall electrofishing, and monitoring the genetic influence of FLMB using fin-tissue samples from Largemouth Bass. The management plan also recommended continuing to monitor the reservoir's hydrilla coverage.
- **Fish Community**
  - **Prey species:** Clupeid (Threadfin and Gizzard Shad) and sunfish populations provide adequate prey for sport fish populations. A mixture of sunfish species, including Bluegill and Redear Sunfish, also contribute to the prey base.
  - **Catfishes:** The Channel Catfish population shows consistent recruitment to legal size, with fish greater than 25 inches observed in samples. Body condition of Channel Catfish was excellent.
  - **Temperate basses:** White Bass populations have been subject to periodic fish kills, although the population appears to have recovered. Palmetto Bass stockings have not been conducted since 2000, and no Palmetto Bass were observed in 2013.
  - **Black basses:** Largemouth Bass exhibit adequate natural recruitment, although low catch rates of legal-length ( $\geq 14$  inches) bass were observed. Low electrofishing catch rate in 2012 was likely influenced by poor sampling conditions, resulting from low water levels.
  - **Crappie:** According to anecdotal reports, White Crappie and Black Crappie are present in the reservoir. However, trap netting was not conducted in 2012 due to low catch rates in previous years.
- **Management Strategies:** Continue standard fisheries monitoring in 2016 and 2017. Monitor water level impact on recreational access and fish populations. Continue to monitor hydrilla coverage if expansion is reported, and during standard vegetation survey in 2016.

## INTRODUCTION

This document is a summary of fisheries data collected from Pat Mayse Reservoir in 2012 and 2013. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2012 and 2013 data for comparison.

### *Reservoir Description*

Pat Mayse Reservoir is a 5,940-acre impoundment located in Lamar County, Texas, on Sanders Creek in the Red River basin. The reservoir is located approximately 13 miles north-northwest of Paris, Texas, and is operated and controlled by the U. S. Army Corps of Engineers (USACE). Primary water uses included flood control, municipal and industrial water supply, and recreation. Habitat at time of sampling consisted of natural shoreline, standing timber, native floating and emergent aquatic vegetation. Total aquatic vegetation coverage was less than 5% of reservoir area. Other descriptive characteristics for Pat Mayse Reservoir are presented in Table 1.

### *Angler Access*

Pat Mayse reservoir has eight boat ramps maintained by the USACE. Shoreline access is adequate within six recreation areas surrounding the reservoir. Boat access to the reservoir is adequate. Terminal end of boat ramps was not measured during the survey period. However, three boat ramps (Sanders Cove Loop C, Pat Mayse East Loop B, and Pat Mayse West Loop B ramps) were closed in 2011 as a result of a four-foot water-level decline below conservation elevation.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Storey and Jubar 2008) included:

1. Conduct additional electrofishing in 2010 to monitor Largemouth Bass (*Micropterus salmoides*) relative abundance, condition, and size structure. Collect fin samples from Largemouth Bass to monitor Florida Largemouth Bass (*M. s. Floridanus*) allele frequency, and request stockings of FLMB at 50 fish/acre in 2010 and 2011.

**Action:** Additional electrofishing was not conducted in 2010. Electrofishing was conducted in 2012, and genetic samples were collected and analyzed. Stocking of FLMB fingerlings was conducted in 2011 at the requested stocking rate.

2. Monitor the hydrilla (*Hydrilla verticillata*) coverage at Pat Mayse Reservoir and recommend treatment to USACE if necessary.

**Action:** Hydrilla coverage in the reservoir has remained low and has not required action. No hydrilla was observed during the vegetation survey in 2012.

**Harvest regulation history:** All sport fishes in Pat Mayse Reservoir are currently managed with statewide harvest regulations (Table 2).

**Stocking history:** Florida Largemouth Bass (FLMB) were introduced in 1981, and were stocked in 1983, 1991, 1994, 2003, 2004, and 2011. Channel Catfish (*Ictalurus punctatus*) were introduced in 1967, and developed a self-sustaining fishery. Stocking of Palmetto Bass (*Morone chrysops* x *M. saxatilis*) was conducted periodically from 1973 to 1986, and annually from 1991 to 2000. Stocking of Palmetto Bass was discontinued due to low directed fishing pressure. A complete stocking history is found in Table 3.

**Vegetation/habitat management history:** Hydrilla was discovered in the reservoir in 2000; however, the plant has remained below 1% of reservoir surface area. Hydrilla coverage has been monitored every four years, and was not found in a 2012 survey.

**Water transfer:** The City of Paris, Texas, currently owns all water rights to Pat Mayse Reservoir, and operates the only raw water intake facility at the reservoir. From there, raw water is transferred to the City's water treatment facility. This water is used to supply residents of the City of Paris as well as industrial customers including Lamar County Water Supply District, Campbell Soup Corporation, Lamar Power Partners, and Direct Energy. Pat Mayse Reservoir is located along Sanders Creek, a tributary of the Red River, approximately four miles upstream of its confluence with the Red River. The reservoir's proximity to the Red River may increase risk of infestation by exotic species such as zebra mussels and Asian carp, where they are known to inhabit. The development of future water transfers and reuse scenarios from Lake Crook or Pine Creek may increase these risks.

## METHODS

Fishes were collected by electrofishing (1.5 hours at 18, 5-min stations), and gill netting (10 net nights at 10 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill nets, as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Aquatic vegetation and littoral habitat surveys were performed according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011) in August 2012. Shoreline distances and areas of vegetation were estimated using ArcView GIS software.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight ( $W_r$ )] were calculated for target fishes according to Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for Gizzard Shad (*Dorosoma cepedianum*) (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error ( $RSE = 100 \times SE$  of the estimate/estimate) was calculated for CPUE. White Bass (*M. chrysops*) ages were determined using otoliths from 15 specimens with lengths ranging from 10.0 to 10.9 inches.

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2012 and by electrophoresis for previous years.

Source for water level data was the United States Geological Survey (USGS) website.

## RESULTS AND DISCUSSION

**Habitat:** A comprehensive vegetation survey was conducted in August 2012. Water elevation at the time of the survey was 1.6 feet below conservation pool elevation (cpe) and total vegetation coverage was less than 5% of reservoir surface area. Major habitat components consisted of native emergent and floating aquatic vegetation, muskgrass (*Chara vulgaris*), and standing timber (Table 4 and 5). Hydrilla coverage has steadily declined since 2000 when 30.2 acres (0.5%) were recorded (Storey and Jubar 2009). Hydrilla was not observed in the 2012 survey (Table 5).

**Prey species:** Primary prey species included Bluegill (*Lepomis macrochirus*), Threadfin Shad (*D. petenense*), Gizzard Shad, and Redear (*L. microlophus*). Combined catch rates of Gizzard and Threadfin Shad were moderate (130.0/h) (Appendix A), although just under half of the Gizzard shad were available

as prey (IOV=48) to most predators. Bluegill relative abundance was adequate (232.0/hour) in 2012, and made up approximately 85% of the sunfish collected in electrofishing.

**Channel Catfish:** Pat Mayse Reservoir maintained an abundant population of Channel Catfish with high natural recruitment. Catch rates and population characteristics remained consistent between survey years (8.3/nn, 7.2/nn, and 8.4/nn in 2007, 2009, and 2013, respectively) (Figure 5). The Channel Catfish population was dominated by legal-sized ( $\geq 12$  inches) fish (PSD = 75), with a significant proportion of preferred-size ( $\geq 24$  inches) individuals (PSD-P = 10).

**Temperate basses:** The White Bass (*M. chrysops*) population appeared to have rebounded from species-specific fish kills last reported in summer 2005 (Storey and Jubar 2009). Catch rates in 2013 were 10.7/nn (Figure 6), which was similar to catch rates (10.5/nn) in spring 2005 before the last fish kill (Jubar and Storey 2009). Growth of White Bass in Pat Mayse Reservoir was slower than that observed in 2009, in which fish reached legal length (10 inches) at age 1. In 2013, average age at 10 inches (10.0 to 10.9 inches) was 1.9 years (N = 15; range = 1 – 2 years). Palmetto Bass stockings were discontinued in 2000, and catch rates have declined (Storey and Jubar 2009); 2013 was the first survey year no Palmetto Bass were collected.

**Black basses:** Electrofishing catch rates of Largemouth Bass (Figure 7) remained moderate (66.0/h in 2012, 71.3/h in 2008, and 33.3/h in 2004), and were likely reflective of low water level (Figure 1), limited habitat, and resulting poor sampling conditions. The population was dominated by small fish (PSD = 22), and few legal length fish were typically observed. Florida Largemouth Bass influence has remained constant as Florida alleles were 30% despite a 2011 FLMB stocking. No pure Florida Largemouth Bass were observed in the sample. Spotted Bass (*M. punctulatus*), were also present in Pat Mayse Reservoir, though catch rates were low (4.7/h) (Appendix A).

**Crappie:** White (*Pomoxis annularis*) and Black Crappie (*P. nigromaculatus*) were present in Pat Mayse Reservoir, and anecdotal accounts suggest a fishery exists (pers. Comm. Lamar Co. Game Warden, Bryan Callihan). Trap net sampling was not conducted in 2012 due to low catch rates in 2004 (1.5/nn) and 2008 (0.2/nn).

## Fisheries management plan for Pat Mayse Reservoir, Texas

Prepared – July 2013

**ISSUE 1:** Pat Mayse Reservoir was stocked with Florida Largemouth Bass in 2011. The population is characterized by small fish, and few fish over the minimum length limit were encountered. The Largemouth Bass population does not exhibit trophy potential. Habitat quality is not sufficient to aide in the recruitment of stocked fingerlings.

### MANAGEMENT STRATEGIES

1. Monitor Largemouth Bass abundance, condition, and population size structure, through standard electrofishing in 2016.
2. Discontinue stocking requests of Florida Largemouth Bass fingerlings, although consider submitting requests for surplus FLMB brood fish when available.

**ISSUE 2:** The Channel Catfish population at Pat Mayse Reservoir exhibits good natural recruitment, and is characteristic of a minimally-exploited population. The fishery could benefit from additional promotion if underutilized.

### MANAGEMENT STRATEGY

1. Investigate avenues to promote the Channel Catfish fishery through news releases and communication with local angling groups.

**ISSUE 3:** The invasive aquatic plant hydrilla has been present in Pat Mayse Reservoir for a number of years, but has not created access problems for recreational users. Coverage declined in recent years, and was not observed in the 2012 vegetation survey.

### MANAGEMENT STRATEGIES

1. Continue monitoring of hydrilla at Pat Mayse Reservoir every four years. Expansion rates are typically low in this reservoir, and the plant is not considered an immediate threat to recreational access or reservoir water uses.
2. In the event this plant becomes problematic, work with US Army Corps of Engineers to develop an integrated pest management plan.

**ISSUE 4:** Public access at three boat ramps (Sanders Cove Loop C, Pat Mayse East Loop B, and Pat Mayse West Loop B ramps) was temporarily closed in 2011 as a result of low water levels. Despite these closures, the USACE maintained five additional boat ramps with adequate access.

### MANAGEMENT STRATEGY

1. Discuss potential options of improving boat ramp access with USACE, including funding options like the Boating Access Grant and partnership with the City of Paris.

**ISSUE 5:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive

vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

#### MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc., so that they can, in turn, educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

#### SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes standard fall electrofishing, gill netting, trap netting, and access and aquatic vegetation surveying in 2016-2017 (Table 6). Electrofishing will monitor prey fishes and Largemouth Bass dynamics, gill netting will monitor Channel Catfish and White Bass recruitment, condition, and relative abundance, and trap netting will monitor White and Black Crappie recruitment, condition, and relative abundance.



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[http://waterdata.usgs.gov/nwis/monthly?referred\\_module=sw&site\\_no=07335390](http://waterdata.usgs.gov/nwis/monthly?referred_module=sw&site_no=07335390)

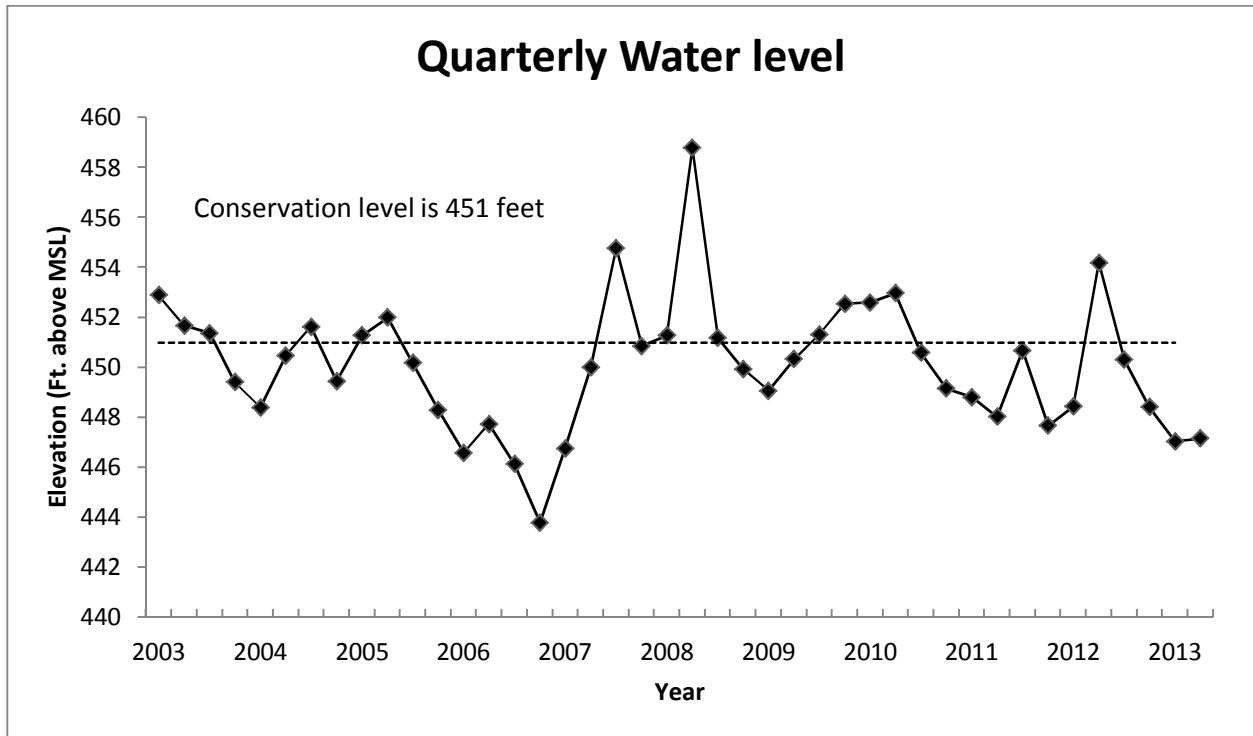


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Pat Mayse Reservoir, Texas.

Table 1. Characteristics of Pat Mayse Reservoir, Texas.

| Characteristic                    |                              | Description |
|-----------------------------------|------------------------------|-------------|
| Year constructed                  | 1967                         |             |
| Controlling authority             | U.S. Army Corps of Engineers |             |
| County                            | Lamar                        |             |
| Reservoir type                    | Water Supply                 |             |
| Shoreline Development Index (SDI) | 1.9                          |             |
| Conductivity                      | 280 umhos/cm                 |             |

Table 2. Harvest regulations for Pat Mayse Reservoir, Texas.

| Species   | Bag limit                  | Length limit (inches) |
|---|----------------------------|-----------------------|
| Catfish: Channel and Blue Catfish, their hybrids and subspecies | 25<br>(in any combination) | 12-inch minimum       |
| Catfish, Flathead   | 5                          | 18-inch minimum       |
| Bass, White   | 25                         | 10 - No Limit         |
| Bass, Palmetto  | 5                          | 18 - No Limit         |
| Bass, Largemouth  | 5 <sup>a</sup>             | 14-inch minimum       |
| Bass, Spotted   | 5 <sup>a</sup>             | No Limit - No Limit   |
| Crappie: White and Black Crappie, their hybrids and subspecies  | 25<br>(in any combination) | 10-inch minimum       |

<sup>a</sup> Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 3. Stocking history of Pat Mayse Reservoir, Texas. Size categories are: FGL = 1-3 inches; and ADL = adults.

| Year                           | Number         | Size |
|--------------------------------|----------------|------|
| <u>Threadfin Shad</u>          |                |      |
| <u>1986</u>                    | <u>1,000</u>   | ADL  |
| Species total                  | 1,000          |      |
| <u>Channel Catfish</u>         |                |      |
| <u>1967</u>                    | <u>162,400</u> | FGL  |
| Species total                  | 162,400        |      |
| <u>Palmetto Bass</u>           |                |      |
| 1973                           | 46,303         | FGL  |
| 1974                           | 60,000         | FGL  |
| 1975                           | 59,773         | FGL  |
| 1976                           | 60,000         | FGL  |
| 1979                           | 30,000         | FGL  |
| 1982                           | 63,000         | FGL  |
| 1986                           | 89,495         | FGL  |
| 1991                           | 95,000         | FGL  |
| 1992                           | 98,700         | FGL  |
| 1993                           | 49,284         | FGL  |
| 1994                           | 89,758         | FGL  |
| 1995                           | 121,525        | FGL  |
| 1996                           | 42,801         | FGL  |
| 1997                           | 42,175         | FGL  |
| 1998                           | 42,200         | FGL  |
| 1999                           | 21,084         | FGL  |
| <u>2000</u>                    | <u>42,027</u>  | FGL  |
| Species total                  | 1,053,125      |      |
| <u>Largemouth Bass</u>         |                |      |
| 1967                           | 505,000        | FGL  |
| <u>1968</u>                    | <u>901,000</u> | FGL  |
| Species total                  | 1,406,000      |      |
| <u>Florida Largemouth Bass</u> |                |      |
| 1981                           | 7,980          | FGL  |
| 1983                           | 289,375        | FGL  |
| 1991                           | 289,390        | FGL  |
| 1994                           | 301,790        | FGL  |
| 2003                           | 298,658        | FGL  |
| 2004                           | 147,910        | FGL  |
| <u>2011</u>                    | <u>298,130</u> | FGL  |
| Species total                  | 1,633,233      |      |

Table 4. Survey of structural habitat types, Pat Mayse Reservoir, Texas, August 2012. Shoreline habitat type units are in miles and standing timber is acres.

| Habitat type    | Estimate   | % of total |
|-----------------|------------|------------|
| Natural         | 42.6 miles | 96.6       |
| Rocky           | 1.5 miles  | 3.3        |
| Standing timber | 12.3 acres | 28.0       |

Table 5. Survey of aquatic vegetation, Pat Mayse Reservoir, Texas, 2012. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

| Vegetation                          | 2012        |
|-------------------------------------|-------------|
| Native submersed <sup>1</sup>       | 187.3 (3.5) |
| Native floating-leaved <sup>2</sup> | 0.7 (<0.1)  |
| Native emergent <sup>3</sup>        | 37.3 (0.7)  |

<sup>1</sup> Muskgrass

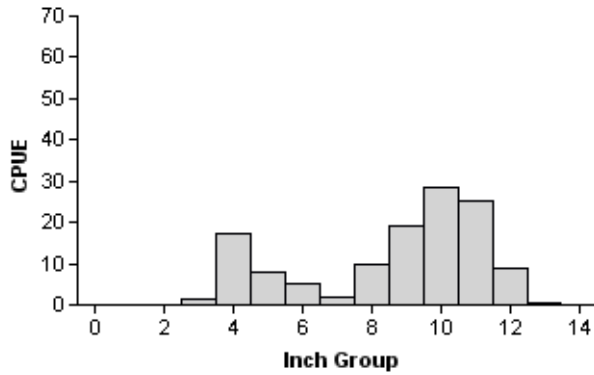
<sup>2</sup> American Lotus

<sup>3</sup> Giant Cutgrass and Bulrush

## Gizzard Shad

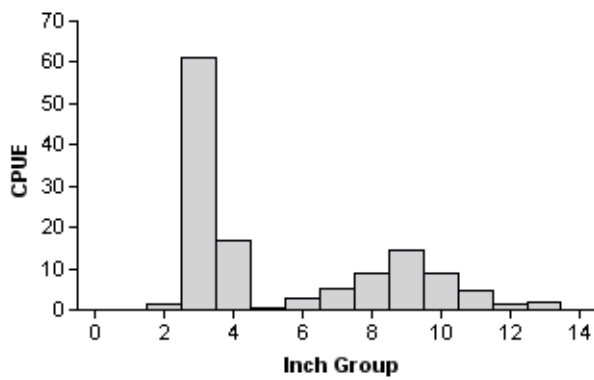
2004

Effort = 1.5  
Total CPUE = 126.7 (17; 190)  
IOV = 27 (4.8)



2008

Effort = 1.5  
Total CPUE = 128.0 (27; 192)  
IOV = 69 (8.2)



2012

Effort = 1.5  
Total CPUE = 94.0 (17; 141)  
IOV = 48 (8.2)

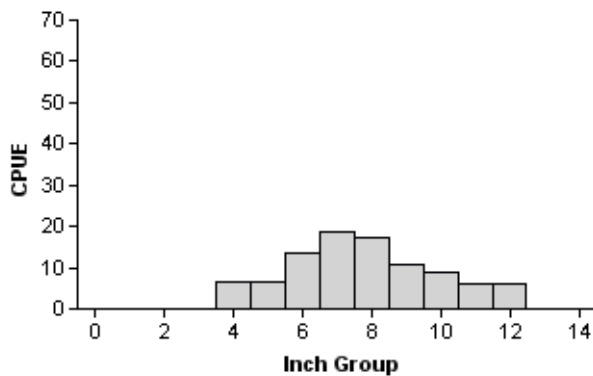
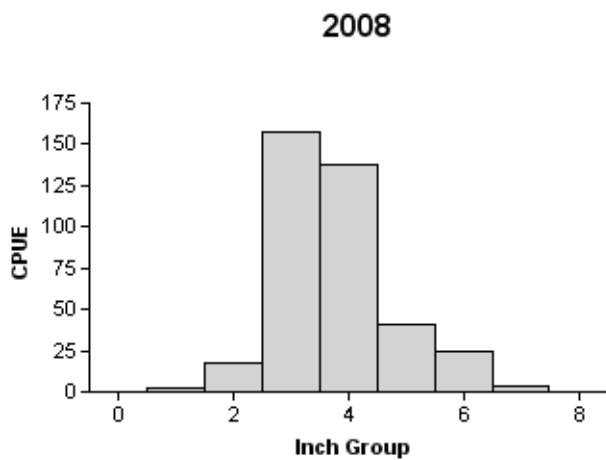


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Pat Mayse Reservoir, Texas, 2004, 2008, and 2012.

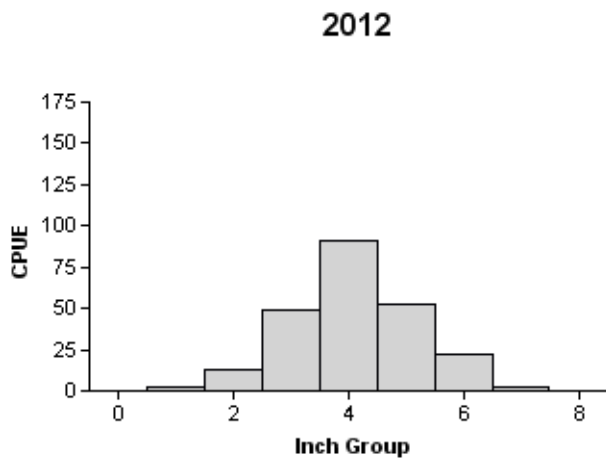
## Bluegill



Effort = 1.5  
 Total CPUE = 202.0 (26; 303)  
 PSD = 15 (3.8)



Effort = 1.5  
 Total CPUE = 383.3 (14; 575)  
 PSD = 8 (1.8)



Effort = 1.5  
 Total CPUE = 232.0 (19; 348)  
 PSD = 11 (2.3)

Figure 3. Number of Bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Pat Mayse Reservoir, Texas, 2004, 2008, and 2012.

## Redear Sunfish

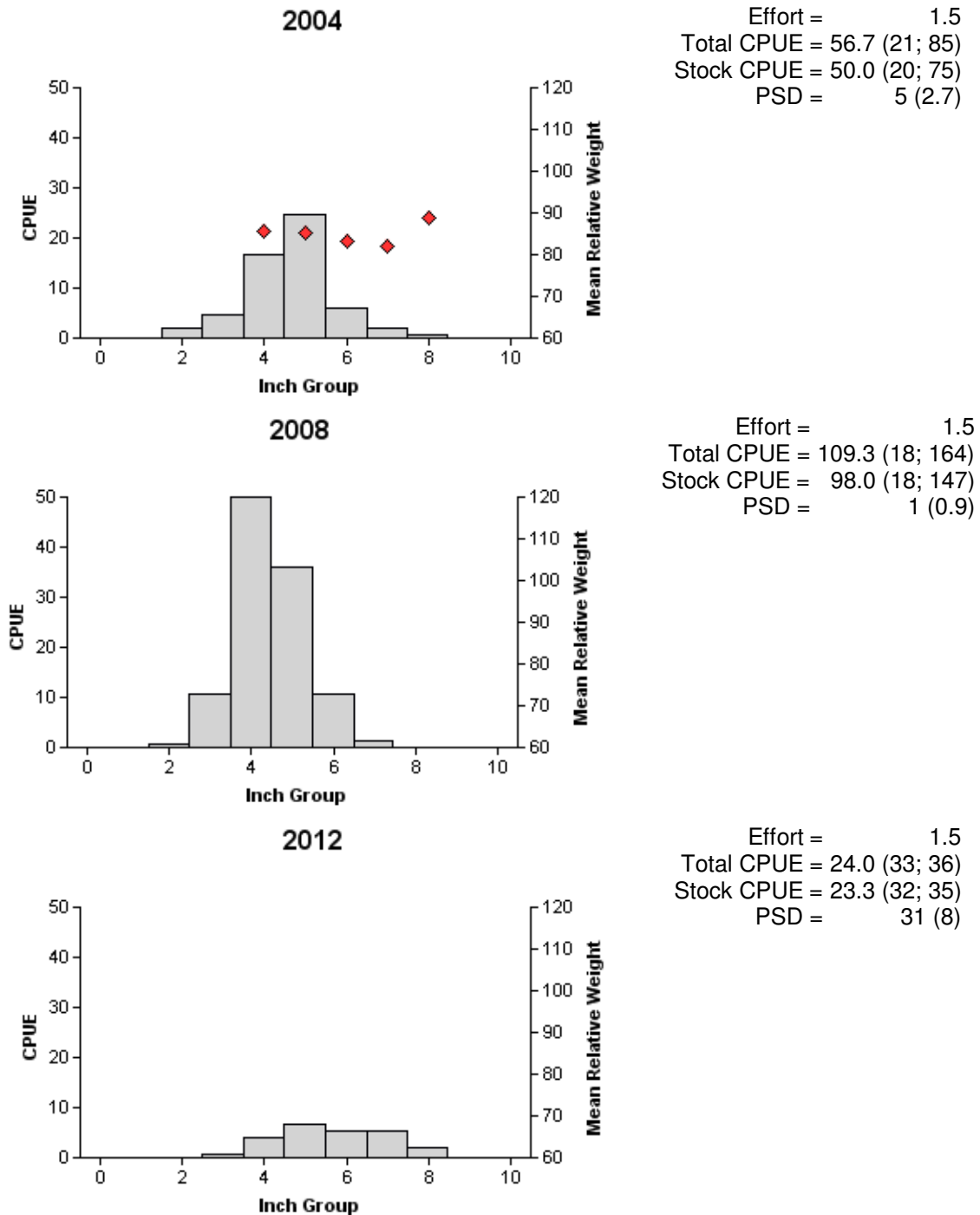


Figure 4. Number of Redear Sunfish caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Pat Mayse Reservoir, Texas, 2004, 2008, and 2012.



## Channel Catfish

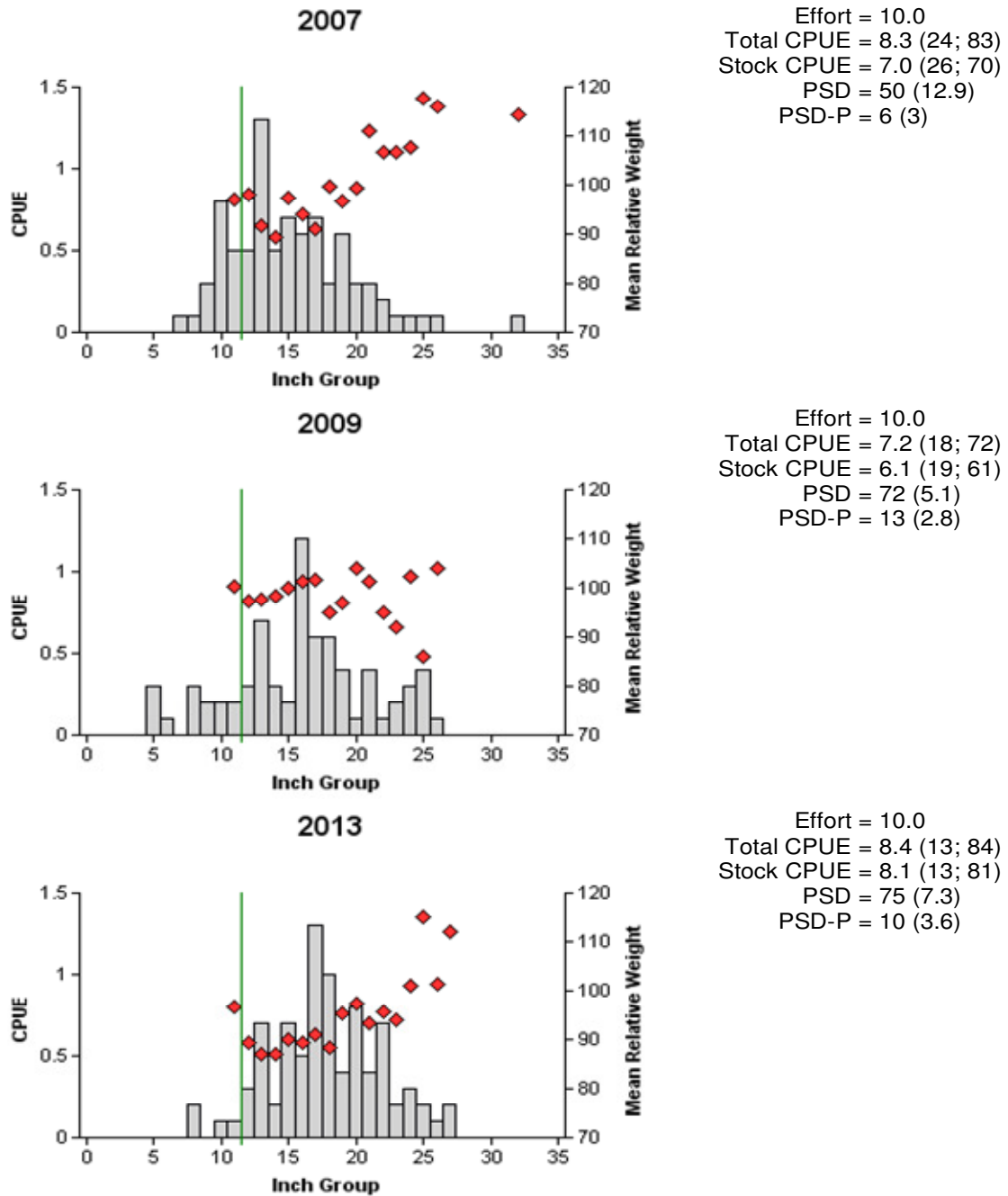


Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Pat Mayse Reservoir, Texas, 2007, 2009, and 2013. Vertical lines indicate minimum length limit at time of survey.

## White Bass

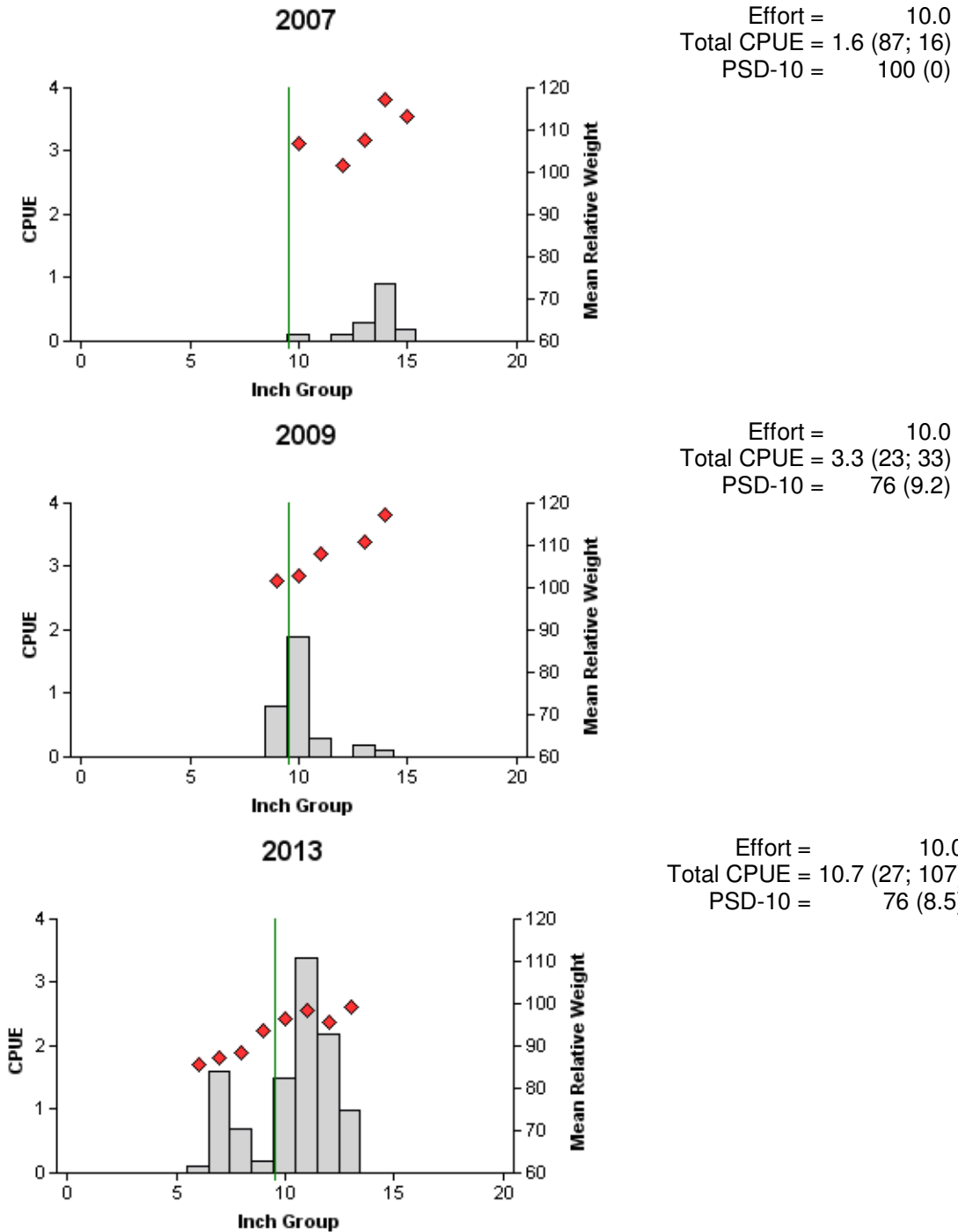
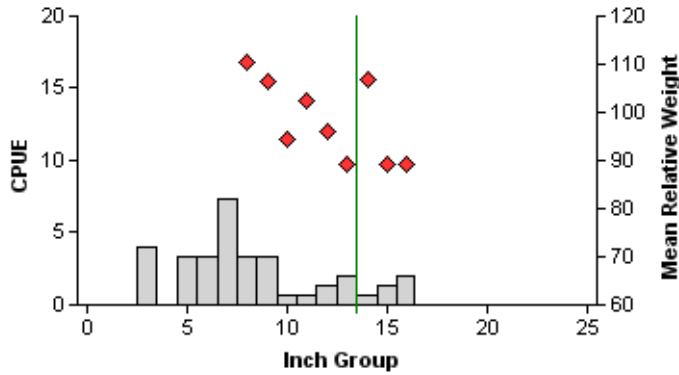


Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Pat Mayse Reservoir, Texas, 2007, 2009, and 2013. Vertical lines indicate minimum length limit at time of survey.

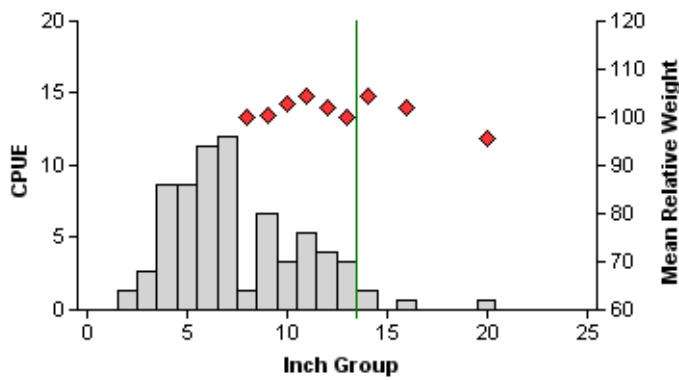
## Largemouth Bass

2004



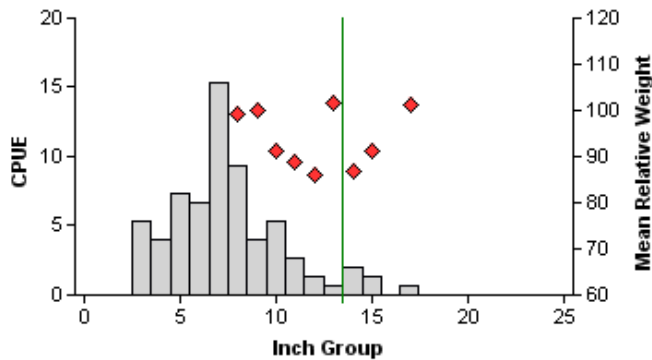
Effort = 1.5  
 Total CPUE = 33.3 (35; 50)  
 Stock CPUE = 15.3 (33; 23)  
 PSD = 48 (9.4)  
 PSD-P = 22 (8.7)

2008



Effort = 1.5  
 Total CPUE = 71.3 (34; 107)  
 Stock CPUE = 26.7 (32; 40)  
 PSD = 38 (6.8)  
 PSD-P = 5 (3.7)

2012



Effort = 1.5  
 Total CPUE = 66.0 (19; 99)  
 Stock CPUE = 27.3 (20; 41)  
 PSD = 22 (6.2)  
 PSD-P = 7 (3.8)

Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Pat Mayse Reservoir, Texas, 2004, 2008, and 2012. Vertical lines represent length limit at time of survey.

## Largemouth Bass

Table 6. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Pat Mayse Reservoir, Texas, 2004, 2008, and 2012. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

| Year | Sample size | Number of fish |            |      | % FLMB alleles | % FLMB |
|------|-------------|----------------|------------|------|----------------|--------|
|      |             | FLMB           | Intergrade | NLMB |                |        |
| 2004 | 38          | 0              | 34         | 4    | 39             | 0      |
| 2008 | 30          | 0              | 27         | 3    | 30             | 0      |
| 2012 | 29          | 0              | 28         | 1    | 30             | 0      |

Table 7. Proposed sampling schedule for Pat Mayse Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

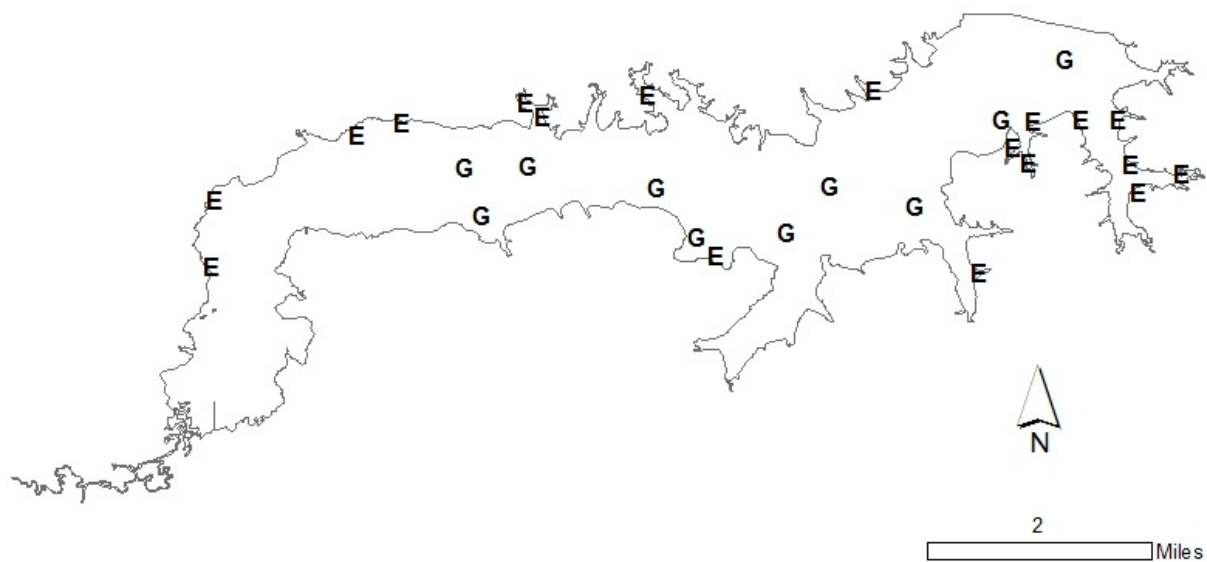
| Survey<br>year | Electrofishing | Trap<br>net | Gill<br>net | Habitat    |            |        | Report |
|----------------|----------------|-------------|-------------|------------|------------|--------|--------|
|                |                |             |             | Structural | Vegetation | Access |        |
| 2013-2014      |                |             |             |            |            |        |        |
| 2014-2015      |                |             |             |            |            |        |        |
| 2015-2016      |                |             |             |            |            |        |        |
| 2016-2017      | S              | A           | S           | A          | S          | S      | S      |

**APPENDIX A**

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Pat Mayse Reservoir, Texas, 2012 to 2013. Sampling effort was 10 net nights for gill netting, and 1.5 hours for electrofishing.

| Species         | Gill Netting |      | Fall Electrofishing |       |
|-----------------|--------------|------|---------------------|-------|
|                 | N            | CPUE | N                   | CPUE  |
| Gizzard Shad    |              |      | 141                 | 94.0  |
| Threadfin Shad  |              |      | 54                  | 36.0  |
| Channel Catfish | 84           | 8.4  |                     |       |
| White Bass      | 107          | 10.7 |                     |       |
| Redear Sunfish  |              |      | 36                  | 24.0  |
| Bluegill        |              |      | 348                 | 232.0 |
| Longear Sunfish |              |      | 20                  | 13.3  |
| Warmouth        |              |      | 4                   | 2.7   |
| Largemouth Bass |              |      | 99                  | 66.0  |
| Spotted Bass    |              |      | 7                   | 4.7   |

## APPENDIX B



Location of sampling sites, Pat Mayse Reservoir, Texas, 2012 to 2013. Gill netting and electrofishing stations are indicated by G and E, respectively.